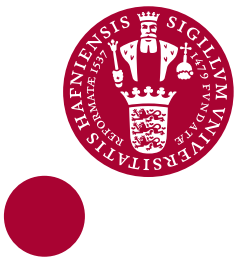


Sterculia quinqueloba (Garcke) K. Schum

Gondwe, Dominic; Sacandé, Moctar; Kambadya, Frank; Schmidt, Lars

Published in:
Seed Leaflet

Publication date:
2007

Document version
Publisher's PDF, also known as Version of record

FOREST & LANDSCAPE

SEED LEAFLET

No. 133 December 2007

MILLENNIUM SEED BANK PROJECT Kew

DARWIN INITIATIVE

Sterculia quinqueloba (Garcke) K. Schum

Taxonomy and nomenclature

Family: Sterculiaceae

Vernacular/common names: English names include large-leaved star chestnut and large-leaved sterculia. Local names include: mkweranyani (Kiswahili), mkwelandege (Kisukuma, Kihehe, Kisangu), mkungulanga, mguwa (Kinyamwezi).

Distribution and habitat

Sterculia quinqueloba is native to hot and dry regions of sub-Saharan Africa. It occurs at medium to low altitudes, on hill slopes, in deciduous woodland and bushweld. It is also commonly found on rocky outcrops and hills in woodland. Not classified on the IUCN red list of threatened species.

Uses

Sterculia quinqueloba is an important species because of its potential to produce 'Karaya' gum, which has several applications in industry and by local communities. It has shown potential to produce gum of similar properties and value as *Sterculia urens* gum, which is produced and used in India as emulsifier and stabiliser in the food industry. The wood is reddish brown and of relatively poor quality; it is mainly used for furniture, coffin making and other light constructions. The fibre rich bark is used for ropes and mats. The species is also used as an ornamental tree. Despite its poor wood quality for timber, fuelwood and charcoal, the species is facing rapid depletion of large individuals in its natural habitat.

Botanical description

Mostly occurring as a small tree of 5-12 m in height, but it can reach 25 m. The bark is pale cream to pinkish brown, smooth and slightly shiny; it peals off to reveal a silvery, pale inner layer. Branches are thick and stiff. The leaves are simple and crowded at the ends of the branches. The leaves are a dark yellowish green above and grey-yellowish below. The leaves are conspicuously 5 lobed, usually veined from the base and typically 15-40 by 15-40 cm in size.

The flowers are unisexual, yellow and c. 5 mm in diameter. They are terminal many flowered panicles, about 9-30 cm long.

From: Internet source: www.cact.cz/niviny/2003/10/ Namibia

Flowering and fruiting habit

Flowering occurs at the same time as the young leaves, in the Sahelian area generally between January and May. Fruiting generally occurs during the raining season between June and October.

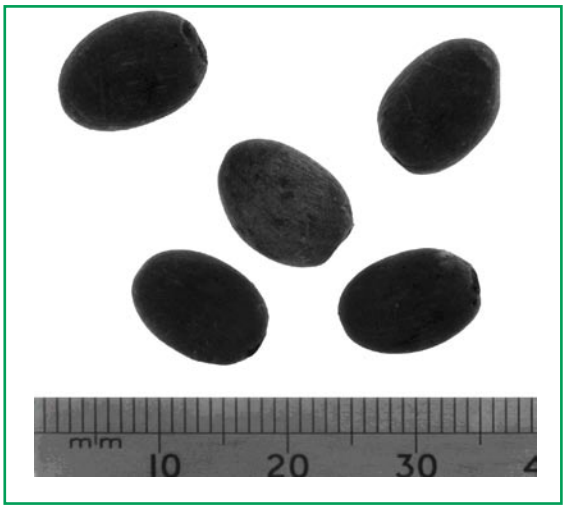
Fruit and seed description

Fruit: The fruit is a woody capsule comprising of 3-5 separate follicles, each up to 6 by 3 cm, which are brown and covered by short golden hairs. At maturity each section splits along one side to reveal 2-3 seeds, which are attached to the edge of the opening among long hairs.

Seed: Mature seeds are black, c. 8-6 mm long, oblong-ellipsoid with a small inconspicuous aril. The average fresh seed weight is c. 10 g. These seeds are endospermic and contain c. 28% oil.

Forest & Landscape Denmark • Hørsholm Kongevej 11 • DK-2970 Hørsholm
Email: SL-International@life.ku.dk • Website: www.SL.ku.dk

PHOTO: H. VAUTIER



S. quinqueloba seeds.

Harvest

The fruits are harvested directly from the trees when the fruits start to split open. Mature seeds are black and can easily be distinguished from the immature white ones. Approximately 18 kg of fruit are required to obtain 1 kg of seed.

Processing and handling

Sun drying will cause the fruits to split open. Seeds are then manually extracted from fruit pods by shaking. Mature black seeds are separated from immature white ones. Excess gum is removed from the seeds using clean tissue. A floating test allows selection of normal seeds from those infected (a floating test conducted by Kew revealed only c. 13% full seeds, against 87% of insects-infected or empty seeds)

Storage and viability

Seeds of this species exhibit 'orthodox' storage behaviour, and can safely be dried to 8% moisture content. Several studies have reported a low germination percentage (51%) of fresh non-dried seeds sown at 25-28°C, under ambient conditions. Desiccation seems to increase the germination capacity of these seeds, ostensibly as a result of a post harvest maturation process. An experiment showed 80% germination after desiccation to 9-12% MC, compared to initial 47% germination before desiccation. Dried seeds maintain high germination capacity of c. 70% after 6 months storage both in the cold-room at 4°C and under ambient conditions at 25°C. However, seeds with >12% MC decrease in viability over the 6 months period. Thus, it can be recommended that *S. quinqueloba* seeds are desiccated before germinating, storing or distributing them to users.

Dormancy and pretreatment

As drying appears to increase the germination as compared to fresh seed, drying may be used as a pretreatment.

Sowing and germination

Germination is epigeal and typically takes between 2 and 3 weeks under optimal conditions of c. 25°C.

Selected readings

Chanyenga, T., J. Lowore. 1999. Composition and abundance of Sterculia quinqueloba for karaya gum tapping at Kamwamba in Mwanza east. FRIM report No. 99007.

Chanyenga, T. 2004. Desiccation and storage of *Sterculia quinqueloba* seeds from Malawi. In: Sacande *et al*., (Eds.) Comparative storage biology of tropical tree seeds, IPGRI, Rome.

Seed Information Database (SID). 2004. http://www.rbgkew.org.uk/data/sid (release 6.0, October 2004).

IPGRI/DFSC. 1999. The project on handling and storage of recalcitrant and intermediate tropical forest tree seeds. Danida Forest Seed Centre. Newsletter no. 5: 23-39.

Msanga, H.P. 1999. Seed germination of indigenous trees in Tanzania. UBC Press, University of British Columbia.

THIS NOTE WAS PREPARED IN COLLABORATION WITH FORESTRY RESEARCH INSTITUTE AND NATIONAL PLANT GENETIC RESOURCES, ZOMBA, MALAWI

Authors: Dominic Gondwe,
Moctar Sacandé
Frank Kambadya
Editor: Lars Schmidt

Millennium Seed Bank project
Wakehurst Place, Ardingly
West Sussex
RH17 6TN, UK

Phone: +44-1444 894100
Fax: +44-1444 894110
Email: msbsci@kew.org
Website: www.kew.org/msbp